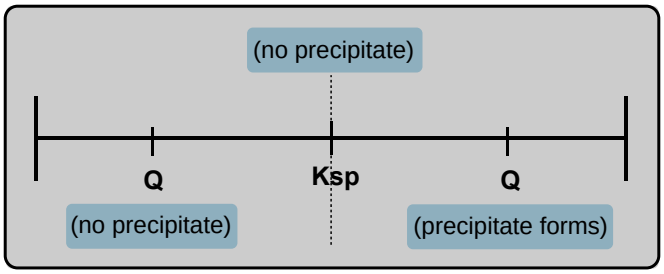
CONCEPT: SELECTIVE PRECIPITATION

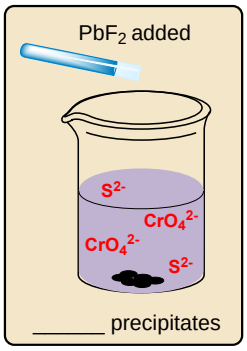
- A process of separating specific _____ out of a solution by using *reagents* that form a _____ with the ions.
  - □ **Reagent** is another _____ that binds to the dissolved ion and precipitates out of a solution.
    - Successful precipitation of a selected ion depends on the _____ (Ksp) of its salt.
    - When Q ____ Ksp: Precipitation is successful



  - □ Use this logic when asked to precipitate (separate) an ion from a mixture of ions based on differing Ksp values.

EXAMPLE: Sample of a solution contains 0.405 M CrO_4^{2-} and 0.628 M S^{2-} ions. These two ions can be precipitated with the use of PbF_2. Which ion will precipitate out first and at which concentration?

($PbCrO_4$ Ksp = 2.0×10^{-16}, PbS Ksp = 7.0×10^{-29}.)



PRACTICE: Solution contains $[Cu^{2+}] = 0.035$ M, $[Sr^{2+}] = 0.054$ M, $[Al^{3+}] = 0.23$ M. Cu^{2+} can be separated by selective precipitation using NaOH. What is the minimum concentration of NaOH needed to start precipitation of Cu^{2+}? (Ksp = 2.2×10^{-20} of $Cu(OH)_2$).